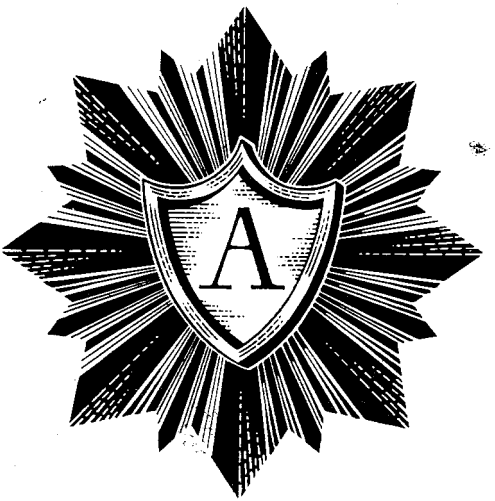
harman kardon

The Award Series



INSTALLATION AND OPERATING MANUAL

MODEL T300X

AM/FM INTEGRATED STEREO MULTIPLEX TUNER

TECHNICAL SPECIFICATIONS

FM

Circuit:	Consists of a tuned grounded grid RF amplifier followed by a low noise triode mixer, 3 high gain wide band pentode IF stages and the renowned Gated Beam, zero time constant limiter. The circuit employs a wide band Foster-Seeley solid state detector, stable Colpitts oscillator and reactance type AFC circuit. Multiplex section has a two stage subcarrier, main carrier triode amplifier followed by a 19 KC synchronous oscillator, m-derived L-R filter, High Q L+R filter, dual phase L-R detector and precision matrix.
Sensitivity:	3.2 microvolts IHFM (usable sensitivity 0.95 microvolts for 20 db of quieting.)
Discriminator Peak To Peak Separation:	1 megacycle, ultra linear.
Image Rejection:	45 DB.
Frequency Response:	±1 db 10-35,000 cycles per second.
MX Adapter Frequency Response:	±1 db 15-15,000 cycles per second.
Distortion:	Unmeasurable at 30% modulation. Less than 0.1% at 100% modulation.
Limiter:	Gated beam constant output.
Antenna:	300 ohms.

AM

Circuits:	Low noise high gain RF pentode followed by a heptode converter, wide band IF stage and a high perveance tube detector with quick action AVC. Special litz wire high-Q loopstick.
Sensitivity:	80 microvolts per meter. Terminal sensitivity 10 mv.
Selectivity:	10 kc bandwidth. 6 db down.
Image Rejection:	50 db.
IF Rejection:	55 db.

GENERAL SPECIFICATIONS

Dimensions:	15¼"W x 5-7/16"H x 11½"D (Excluding Knobs).
Power Consumption:	50 watts.
Finish:	Brushed gold escutcheon.
Shipping Weight:	25 pounds.

INTRODUCTION

The new Harman-Kardon Award Series represents the culmination of extensive research and experimentation in high fidelity component design. These magnificent instruments will satisfy the aspirations of those who insist on nothing short of perfection itself. They also anticipate all of the new developments in high fidelity by including features never before found in high quality components. The keynote in the Award Series is unparalleled performance and no compromise has been made in the design of these superb units.

It is essential you read this instruction manual carefully before installing your T300X tuner. You have invested in a high quality electronic instrument and a few moments taken now to read this manual may save considerable time and effort later on. This booklet has been written in simple, non-technical language and by following the recommendations made in the manual you should be able to obtain optimum performance from your stereophonic system.

KEEP THIS BOOKLET AVAILABLE AT ALL TIMES FOR IT CONTAINS INDISPENSABLE TECHNICAL AND SERVICE INFORMATION.

UNPACKING

After unpacking the T300X, inspect it carefully for signs of transit damage. The tuner was subjected to numerous rigid quality control inspections and therefore should be in perfect operating condition. If damage is visible, notify your dealer at once. If the tuner was shipped to you, notify the transportation company. Harman-Kardon will cooperate with you in such instances, but please note that only you can recover from the carrier for damages incurred during shipment.

Check the folds of the carton and packing material before discarding. Your package should contain the following items:

1 Award Series, Model T300X Tuner.
1 Instruction Manual.
1 Warranty Card.
1 Mounting Template.

WARRANTY POLICY

We urge you to fill in your warranty card and mail it to the factory without delay to protect your rights under warranty. The Harman-Kardon warranty is not valid unless we have your card on file.

WARRANTY

We warrant each T300X to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions herein below set forth, for a period of 1 year from date of delivery to the original purchaser, and agree to replace or repair any part or parts, with the exception of tubes which are under the manufacturer's 90 days warranty, returned to us within said 1 year, with transportation prepaid and which our examination shall disclose to our satisfaction to have been thus defective. This warranty does not include free labor, nor is it applicable to any instrument which shall have been repaired or altered in any way so as in our judgment to affect its stability or reliability nor which has been subject to neglect, misuse, abuse, negligence or accident nor which has had the serial number altered, effaced, or removed. Neither shall this warranty apply to any instrument which has been connected otherwise than in accordance with instructions furnished by us.

This warranty is expressly in lieu of all other warranties, express or implied, and of all other obligations or liability on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this instrument.

SERVICE POLICY

Harman-Kardon has established a special consumer division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write us at any time and we will endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts then we may wish to refer you to one of our authorized warranty stations. The unit must be then shipped via Railway Express, Prepaid to the station designated, accompanied by a brief note describing the exact nature of the difficulty. *Under no circumstances should the set be shipped directly to the factory without prior authorization.*

INSTALLATION PROCEDURE

Ventilation:

The T300X tuner is well ventilated in itself, but sufficient space must be allowed around it to permit proper air flow. Install the tuner in a manner to allow for unrestricted circulation. When mounting into a cabinet allow at least 3 inches above the tubes. Do not place books or other objects on the cage or in the immediate vicinity of the instrument, Reducing the air flow will result in sharply reduced component and tube life. Caution: When custom installing the tuner do not place it directly over the amplifier. The heat generated by the amplifier may cause deterioration of tuner components.

Power Requirements:

Plug the AC cord into any outlet furnishing 117 volts, 50 or 60 cycle, AC current. The voltage may vary between 105 and 125 volts. An AC convenience receptacle is located on the rear of the chassis and is controlled by the on/off switch.

Audio Output:

Two AUDIO OUTPUT receptacles are located on the rear of the chassis. They are used to connect the T300X tuner to your amplifier for either AM/FM operation or FM multiplex. A third output receptacle located near the two audio outputs provides a multiplex signal which may be used for experimental purposes. It is not required for the normal operation of this tuner.

The special de-emphasis characteristic of the T300X includes the capacitance of the shielded connecting cable supplied with this set. If it is necessary to use a patch cord longer than three feet, use the following chart to determine cable type.

LENGTH OF CABLE	CABLE TYPE
3 feet	Any Shielded Patch Cord
Above 3 feet up to 10 feet	RG 59/U
Above 10 feet up to 20 feet	RG 71/U

Connecting The Tuner To Your Amplifier:

To operate the T300X as a conventional AM/FM monophonic tuner, connect a shielded patch cord between either monophonic output receptacle and the TUNER or AUX input of your amplifier.

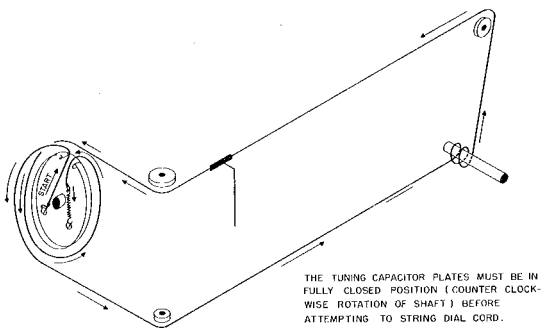
Connecting The Tuner For Stereo FM Multiplex And Monophonic Reception:

Attach two shielded patch cords between the Left and Right STEREO MULTIPLEX outputs on the rear of the tuner and the TUNER, AUX or MX inputs of your stereo amplifier. This connection will also enable you to operate your T300X monophonically when the amplifier is set to the monophonic function.

AM ALIGNMENT PROCEDURE

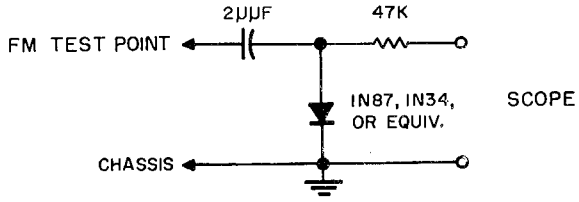
1. Use lowest input signal for usable indication.

STEP	ALIGN.	GENERATOR SETTING		FEED SIGNAL	OUTPUT IND.	DIAL SETTING	ADJUST	ADJUST FOR	NOTES
		FREQ.	MOD.						
1	IF	455 KC	400 CPS	Pin 2 ECH 81	AC VTVM at output jack	1600 KC	1st, 2nd AM IF Trans.	Maximum	
2	OSC	600 KC	400 CPS	Couple signal loosely by loop around loopstick	same	600 KC	Osc. Slug	Maximum	
3	OSC	1400 KC	400 CPS	same	same	1400 KC	Osc. Trimmer	Maximum	
4	Repeat steps 2 and 3.								
5	RF	600 KC	400 CPS	same	same	600 KC	Loopstick Ring RF Trans.	Maximum	
6	RF	1400 KC	400 CPS	same	same	1400 KC	Antenna Trimmer RF Trimmer	Maximum	
7	Repeat steps 5 and 6.								



THE TUNING CAPACITOR PLATES MUST BE IN FULLY CLOSED POSITION (COUNTER CLOCK-WISE ROTATION OF SHAFT) BEFORE ATTEMPTING TO STRING DIAL CORD.

L4185348A

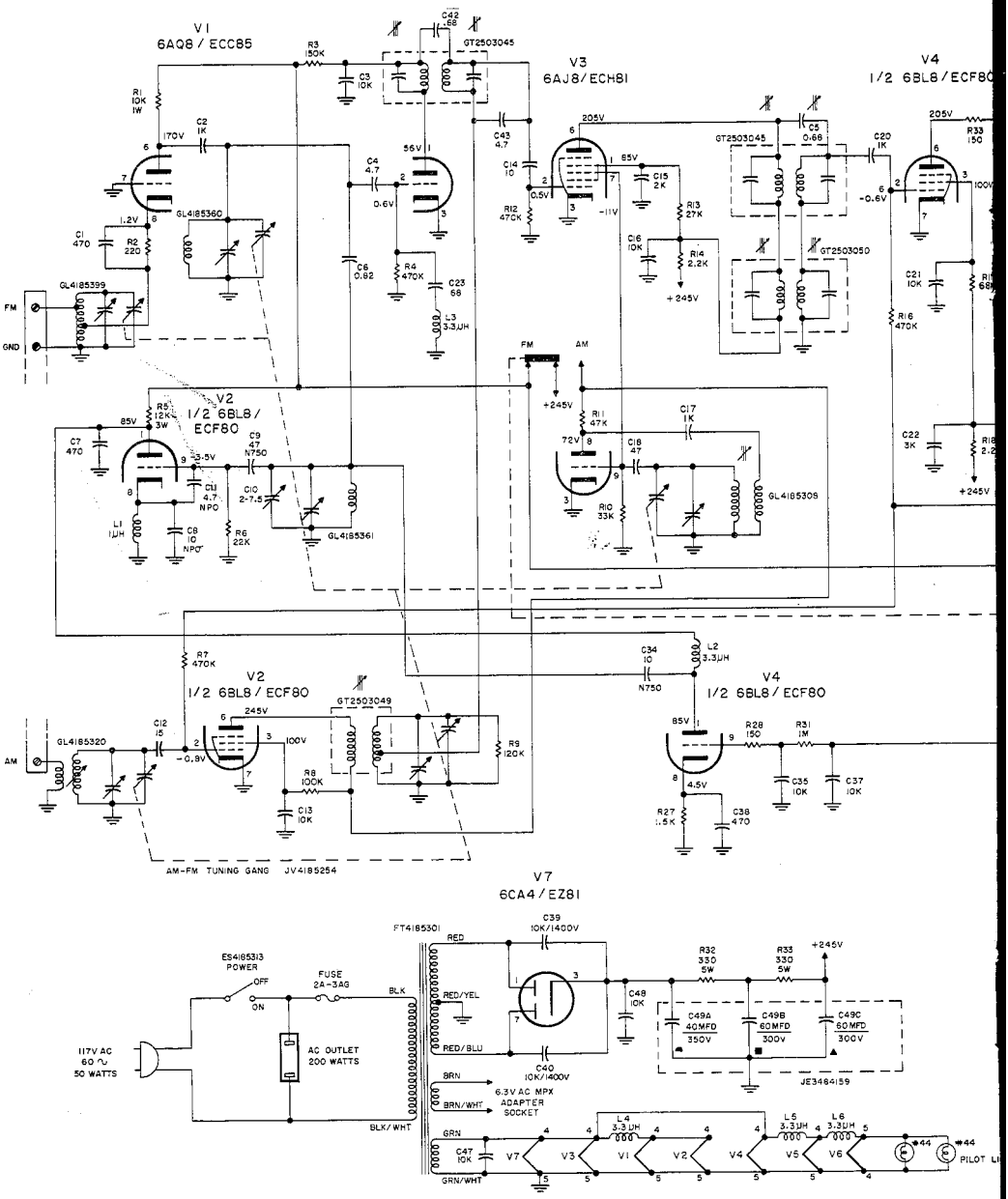


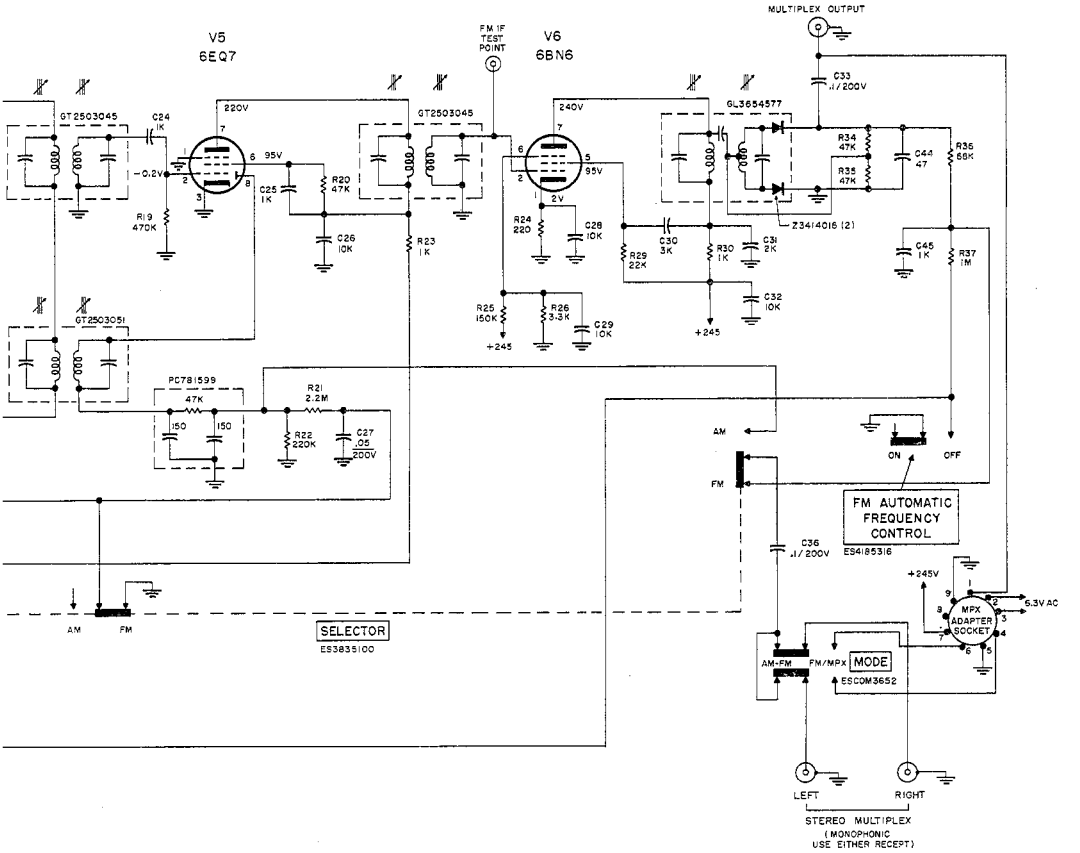
IF TEST PROBE L4185362

FM ALIGNMENT PROCEDURE

1. Turn tuning gang fully CCW. Set pointer at reference mark. 2. AFC off.

STEP	ALIGN.	GENERATOR SETTING		FEED SIGNAL	OUTPUT IND.	DIAL SETTING	ADJUST	ADJUST FOR	NOTES
		FREQ.	MOD.						
1	IF	10.7 MC	60 CPS	See note	Scope @ IF Test Point thru probe	90 MC	1st, 2nd 3rd, 4th IF Trans.	Maximum	Remove ECC85 tube shield. Couple signal by loop around tube.
2	OSC	90 MC	60 CPS	Antenna Terminals	Same	90 MC	Osc. Coil	Maximum	
3	OSC	106 MC	60 CPS	Same	Same	106 MC	Osc. Trimmer	Maximum	
4		Repeat steps 2 and 3.							
5	RF Amp	90 MC	60 CPS	Same	Same	90 MC	Antenna Coil RF Coil	Maximum	
6	RF Amp	106 MC	60 CPS	Same	Same	90 MC	Antenna Trimmer RF Trimmer	Maximum	
7		Repeat steps 5 and 6.							
8	Discriminator	106 MC	60 CPS	Same	Scope at Output	106 MC	Adjust primary for maximum gain and adjust secondary for symmetry.		


V1
6AQ8 / ECC85
V3
6AJ8/ECH81
V4
1/2 6BL8/ECF80
V2
1/2 6BL8/
ECF80
V2
1/2 6BL8/ECF80
V4
1/2 6BL8/ECF80
V7
6CA4/EZ81
GT2503045
GT2503050
GT2503049
GL4185360
GL4185399
GL4185361
GL4185309
GL4185320
FM
AM
GND
+245V
AM-FM TUNING GANG JV4185254
FT4185301
ES4185313
POWER
OFF
ON
FUSE
2A-3AG
BLK
117V AC
60 ~
50 WATTS
AC OUTLET
200 WATTS
BLK/WHT
RED
RED/YEL
RED/BLU
BRN
BRN/WHT
GRN
GRN/WHT
6.3V AC MPX
ADAPTER
SOCKET
JE3484159
PILOT LI



RESISTANCE READINGS

ITEM	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1	ECC85	*150K	470K	0	—	—	*10K	0	220	—
V2	ECF80	*13K	470K	—	—	—	—	0	0	22K
V3	ECH81	*28K	470K	0	—	—	*2.8K	33K	—	33K
V4	ECF80	*13K	470K	*68K	—	—	*2.8K	0	1.5K	1M
V5	6EQ7	0	470K	0	—	—	*49K	*1.6K	*270K	0
V6	6BN6	220	0.8Ω	—	—	*22K	3.3K	*1.6K	—	—
V7	EZ81	140	—	—	—	—	—	140	—	—

VOLTAGE & RESISTANCE READINGS

AC OFF, MODE SWITCH IN AM-FM POSITION, SELECTOR SWITCH IN FM POSITION, AFC SWITCH OFF.

* RESISTANCE READINGS MARKED WITH ASTERISK ARE MEASURED TO PIN 3 6CA4/EZ81.

NOTES:

UNLESS OTHERWISE SPECIFIED —

1 - ALL RESISTANCE VALUES IN OHMS ± 10%.
2 - ALL RESISTORS 1/2 WATT.
3 - ALL CAPACITORS WITH DECIMAL VALUES IN MFD.
4 - ALL CAPACITORS WITHOUT DECIMAL VALUES IN MMF.
5 - ALL VOLTAGES ARE DC & MAY VARY ± 20%.

TS

S4185360A
S418

Connecting The FM Antenna:

Due to the exceptionally high sensitivity of the T300X, an ordinary piece of wire 48" long will be sufficient antenna for all but the most difficult locations. One end of this wire should be stripped of insulation and fastened to the FM terminal on the ANTENNA TERMINAL strip located on the rear panel. The other end of the wire should be extended horizontally and tacked or stapled into place.

If an external antenna is required, use a folded dipole or Yagi cut for the FM band. At times a TV antenna may be also used with satisfactory results. Attach the 300 ohm lead-in wire to the FM and GROUND terminals on the rear of the tuner.

Connecting The AM Antenna:

The ferrite loopstick antenna used in the T300X comprises all the antenna required for good signal areas. In more remote locations an additional outdoor antenna may be required. This should consist of a single wire, as long as is reasonably practical. It must be kept away from power lines and metal objects to insure reception without extraneous noise.

Connect one end of the AM outdoor antenna to the terminal marked AM on the ANTENNA TERMINAL strip on the rear panel.

Grounding:

It is not generally recommended to ground your T300X tuner to its companion amplifier as this may result in a ground loop which will introduce hum into your system.

OPERATING INSTRUCTIONS

Turning The Tuner On and Off:

The power on/off switch is located on the front panel near the tuning control. To turn the tuner on, merely throw the slide switch to the "ON" position.

Automatic Frequency Control Switch:

FM broadcasting, by its very nature, eliminates almost all natural and man-made static. However, the characteristics of FM which make this possible also causes specific problems in tuning. The T300X incorporates a special electronic circuit known as AFC (automatic frequency control) that overcomes these problems and insures proper tuning even if the manual tuning is not accurately done. Therefore AFC always keeps the station in the center of the channel and eliminates distortion caused by inaccurate tuning.

It should be made quite clear that AFC is not a means to eliminate tuner drift. A fine wide band tuner will not drift even upon warm-up whether AFC is in the circuit or not.

The following experiment will lead to an understanding of AFC and how it performs its job.

Throw the AFC switch located on the front panel to "ON". Now tune across the FM band and note how the stations "pop" into place. Now tune to any station, preferably one with a musical program Defeat the AFC circuit by throwing the AFC switch to "OFF", and tune slowly through the station from left to right. Notice there are three distinct points where the station sounds clear, interspersed with points of distorted sound. The middle, clear-sounding point is the proper tuning position fo rthe best tone quality with minimum noise, distortion and interference. Detune the station slightly so that the sound is distorted. Now throw the AFC switch "ON" and notice how the station retunes itself and the sound clears up. The AFC circuit has readjusted the electronic circuits to the center of the station channel.

In order to take full advantage of the benefits of AFC, it is suggested that fine tuning be done with the AFC switch "OFF". When the station is aurally tuned in, throw the AFC switch "ON" and the AFC circuit will retune your careful tuning by a tuning factor of 10:1. This procedure is especially recommended when a weak station is being tuned on a channel adjacent to a stronger one. This will prevent the AFC from reaching for the more powerful signal thereby skipping over the weaker one. Whenever a weak station is being tuned, the AFC should be defeated.

Mode Switch:

The MODE switch selected between AM/FM and FM/Multiplex. It operates in conjunction with the SELECTOR switch located directly next to it.

When playing either AM or FM, place the MODE switch in the "AM/FM" position. When playing multiplex place the MODE switch in the "FM/MX" position.

Selector Switch:

The SELECTOR switch chooses between AM and FM reception and must be operated in conjunction with the MODE switch. For example, if you wish to listen to an FM broadcast, throw the MODE switch to AM/FM and the SELECTOR switch to FM. To listen to AM, allow the MODE switch to remain in AM/FM and throw the SELECTOR switch to AM. For FM Multiplex operation, the MODE switch must be in the FM/MX position and the SELECTOR switch in FM.

Multiplex Noise Filter:

When any FM tuner is operated stereophonically using the FCC approved multiplex system, the signal required to obtain noise-free stereophonic FM reception must be greater than for normal monophonic reception. If noise is present in your system when listening to a multiplex broadcast, merely throw in the MULTIPLEX NOISE FILTER located to the right of the tuning control.

If noise persists, then an external FM antenna may be required.

ADDITIONAL INFORMATION

Fuse:

The T300X is protected by a 2 Amp-3AG fuse. In the event the fuse blows out, replace with only the same type used. Replacing with a fuse of a higher rating will not protect the tuner and will automatically void the warranty.

Hum:

In some installations, hum may be encountered due to a voltage difference between the amplifier, tuner and record changer chassis. This may be eliminated by reversing one or all of the AC power plugs. Simply reverse one at a time until improvement is experienced.

Routine Maintenance:

Due to the conservative design of the T300X, no routine maintenance other than yearly tube checking is required.

Repair:

Only the most qualified service technician should be employed, as special equipment and training is required to properly service a high fidelity instrument. This manual contains information of great value to the repairman, and should be kept available.

Factory Warranty Stations are maintained in most major cities. For the address of the nearest one, or for any other information relating to your Harman-Kardon products, write to the attention of the Customer Service Department, Harman-Kardon, Inc., Plainview, L. I., N. Y. Be sure to include the model and serial number of the set in question. A short description of your complete installation is often of help in answering your questions.

REPLACEMENT PARTS LIST T300X

PART NO.	DESCRIPTION	LIST PRICE
ES4185313	Slide Switch (Stackpole #SS-36-1 Grey)	.35
ESCOM3652	Slide Switch (Stackpole #SS-50 Grey)	.35
ES4185316	Slide Switch (Stackpole #SS-32 Grey)	.25
ES3835000	Slide Switch (Stackpole #SS-34 Grey)	1.05
ZCOM2856	Fuse 2 Amp (3 AG)	.15
FT4185301	Transformer, Power	11.75
HC3835020	Pilot Light Socket L.H.	.85
HC3835021	Pilot Light Socket R.H.	.85
KBCOM3429	Lamp Pilot Light #44	.20
STCOM5158	Tipjack, EF Johnson Minn #105-682-6 (Red)	.30
P4185299	Dial Glass	1.20
P4185300	Pointer	.40
GL4185320	Loopstick Antenna	2.20
GL4185308	AM Osc. Coil	.65
GL2503045	FM IF Trans	1.50
GL2503051	AM IF Trans (2nd)	1.40
GL2503050	AM IF Trans (1st)	1.30
GL3654577	Disc Can W/Two IN541 Matched Diodes	4.85
GL2503049	AM RF Trans	2.50
GC2503070	Choke 3.3 UH	.25
GC2503069	Choke 1 UH	.40
JV3484159	Electrolytic	3.35
PC781599	PC51 (AM Detector Load)	.35
JV4185254	Condenser Variable AM-FM W/Pulley #RC43225 Attached	7.95
JVCOM4724	Trimmer 2-7.5 UUF (Steatite)	.25
P4185282	Escutcheon	7.25
P4185295	Knob 1⅛ Dia. Gray	.45
P3835009	Decorative Plug Button	.25
ER4185370	Noise Fliter Switch	.95
RVCOM5388	50K Pot Screw Driver—Knurl Adust Lin Taper	1.00
P3414016	Crystal Diode — IN542	1.80
GLCOM5390	5 Element M Derived L-R Filter	2.85
GLCOM5422	38KC Doubler	2.00
GLCOM5391	19KC Osc. Coil	2.00
GLCOM5442	L+R Filter	1.00
GLCOM5394	10 MH ±5% W/Center Tap Coil	1.15
JE3283790	2 MFD/25V DC	.55
JECOM5395	2 MFD/300V DC	.75
JE4385449	4 MFD/350V DC	.80

NOTE: To speed handling of your order be sure to include both the model and serial numbers which appear at the back of the chassis, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a C.O.D. basis except for orders $1.00 or less, for which remittance should be enclosed. Prices subject to change without notice. Harman-Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis.